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Conference Abstract

# A Multi-platform Mobile Application to Collect Citizen Science Data for *Bignoniaceae* Phenological Research

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## Abstract

The implementation of Citizen Science in biodiversity studies has led the general public to engage in environmental actions and to contribute to the conservation of natural resources (Chandler et al. 2017). Smartphones have become part of the daily lives of millions of people, allowing the general public to collect data and conduct automatic measurements at a very low cost. Indeed, a series of Citizen Science mobile applications have allowed citizens to rapidly record specimen observations and contribute for the development of large biodiversity databases around the World. Citizen Science applications have a multitude of purposes, as well as target a variety of taxa, biological questions and geographical regions.

Brazil is a megadiverse country that includes many threatened species and Biomes. Conversation efforts are urgent and the engagement of the civil society is critical. Brazilian dry and wet forests are dominated by members of the plant family *Bignoniaceae*, all of which are characterized by beautiful trumpet-shaped flowers and a big-bang flowering strategy. Species of the Neotropical *Bignoniaceae* trees are popularly known in Brazil as “Ipê” and are broadly cultivated throughout the country due to the showy flowers and strong wood. Different species have different flower colors, making its identification relatively easy.

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The showy and colorful flowers are extremely admired by the local population and the media. Flowering of “Ipês” is triggered by dry climate, lower temperatures and increasing day-light, making this group an excellent model for phenological and climatic studies involving Citizen Science.

Here, we developed a multi-platform mobile application focused on the plant family *Bignoniaceae* that allows users to contribute phenological data for species from this plant family. More specifically, through this application the user is able to provide data about specimen locations, phenology and date, all of which can be validated by a photograph. This platform is based on React Native, a hybrid app framework that helps the developers to reuse the code across multiple mobile platforms, a development much more efficient and with efforts focused on the user experience. This technology uses Javascript as programming language and Facebook React as a basis for development. The system is similar to other CS apps such as iNaturalist. Namely, the overall observations improve the quality of the ranking through positive feedback from the community, strengthening the network of interactions between users and encouraging active participation. On the other hand, the application allows users to access all previously stored observations, which, in turn, can suggest improvements to that particular observation. Furthermore, observations without a correct ID can be stored until others can suggest a correct identification, maximizing the value of individual observations and data gathered.

An important aspect of this mobile application is the participation of a network of experts on this plant family, allowing a rapid and accurate verification of individual observations. This team of *Bignoniaceae* experts is also able to make full use of the data gathered by correlating climate and phenological patterns. Results from these analyses are provided to the citizens gathering the data which will, in turn, stimulate the collection of new data, especially in poorly sampled locations. This is a very dynamic mobile application, that aims to engage the civil society with true scientific research, stimulating the management of natural resources and conservation efforts. Through this mobile app, we hope to engage the general public into biodiversity studies by improving their knowledge on an iconic group of Brazilian plants, while contributing data for scientific studies. The system is expected to be released in May and will be available at ipesdobrasil.org.br.

## Keywords

Citizen Science, *Bignoniaceae*, Mobile Application

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